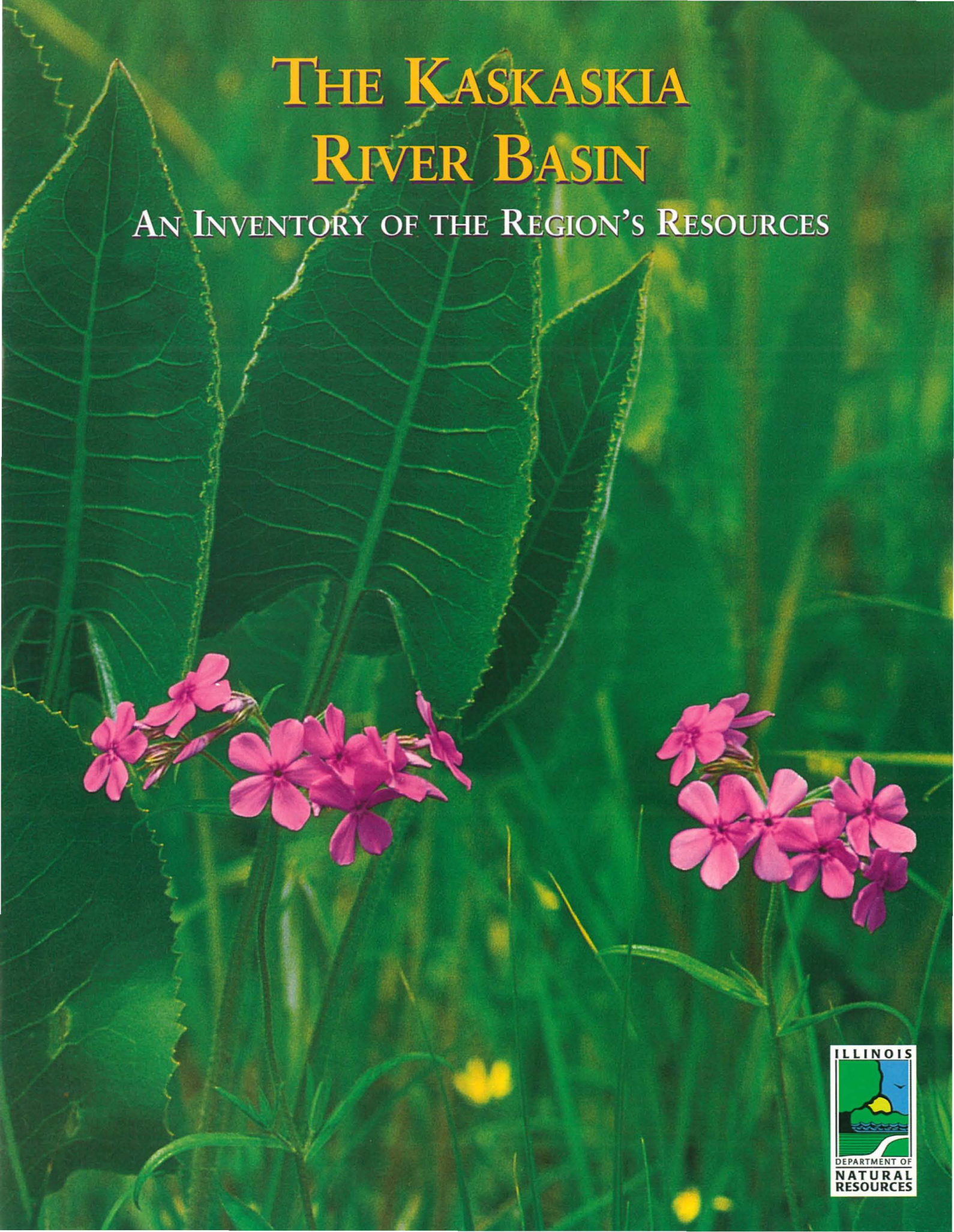
The Kaskaskia River Basin

An Inventory of the Region's Resources



ILLINOIS DEPARTMENT OF NATURAL RESOURCES

About This Report

The Kaskaskia River Basin: An Inventory of the Region's Resources is a product of the Critical Trends Assessment Program (CTAP) and the Ecosystems Program of the Illinois Department of Natural Resources (IDNR). Both are funded largely through Conservation 2000, a State of Illinois program to enhance nature protection and outdoor recreation by reversing the decline of the state's ecosystems.

Conservation 2000 grew out of recommendations from the 1994 CTAP report, *The Changing Illinois Environment*, the 1994 Illinois Conservation Congress, and the 1993 *Water Resources and Land Use Priorities Task Force Report.*

The Critical Trends report analyzed existing environmental, ecological, and economic data to establish baseline conditions from which future changes might be measured, The report concluded that:

- the emission and discharge of regulated pollutants over the past 20 years has declined in Illinois, in some cases dramatically;
- existing data suggest that the condition of natural systems in Illinois is rapidly declining as a result of fragmentation and continued stress;
- data designed to monitor compliance with environmental regulations or the status of individual species are not sufficient to assess ecological health statewide.

The Illinois Conservation Congress and the Water Resources and Land Use Priorities Task Force came to broadly similar conclusions. For example, the Conservation Congress concluded that better stewardship of the state's land and water resources could be achieved by managing them on an ecosystem basis. Traditional management and assessment practices focus primarily on the protection of relatively small tracts of land (usually under public ownership) and the cultivation of single species (usually game animals or rare and endangered plants and animals). However, ecosystems extend beyond the boundaries of the largest parks, nature preserves, and fish and wildlife areas. Unless landscapes are managed on this larger scale, it will prove impossible to preserve, protect, and perpetuate Illinois' richly diverse natural resource base.

Because more than 90% of the state's land area is privately owned, it is plainly impossible for Illinois governments to acquire resources on the ecosystem scale. Therefore, the Task Force and the Congress called for public agencies and private landowners to cooperate in a new approach to natural resource protection and enhancement. If landowners can protect, enhance, or restore precious natural resources through enlightened private management, the need for public acquisition can be reduced.

The Congress and the Task Force agreed that this new approach ought to be:

- organized on a regional scale;
- voluntary and based on incentives;
- guided by comprehensive and comprehensible ecosystem-based scientific information;
- initiated at the grassroots rather than in Springfield.

Finally, the Congress and the Task Force agreed that natural resource protection need not hamper local economic development but can enhance it through tourism and outdoor recreation.

CTAP described the reality of ecosystem decline in Illinois, while the Congress and the Task Force laid out principles for new approaches to reversing that decline. And Conservation 2000, designed to achieve that reversal, has implemented a number of their recommendations, drawing on $100 million to fund nine programs in three state agencies.

One of these programs is IDNR's Ecosystems Program. The program redirects existing department activities to support new resource protection initiatives such as Ecosystems Partnerships. These partnerships are coalitions of local and regional interests seeking to maintain and enhance ecological and economic conditions in local landscapes. A typical Ecosystem Partnership project merges natural resource stewardship (usually within a given watershed) with compatible economic and recreational development.

(continued on inside back cover)

A Project of the Critical Trends Assessment Program

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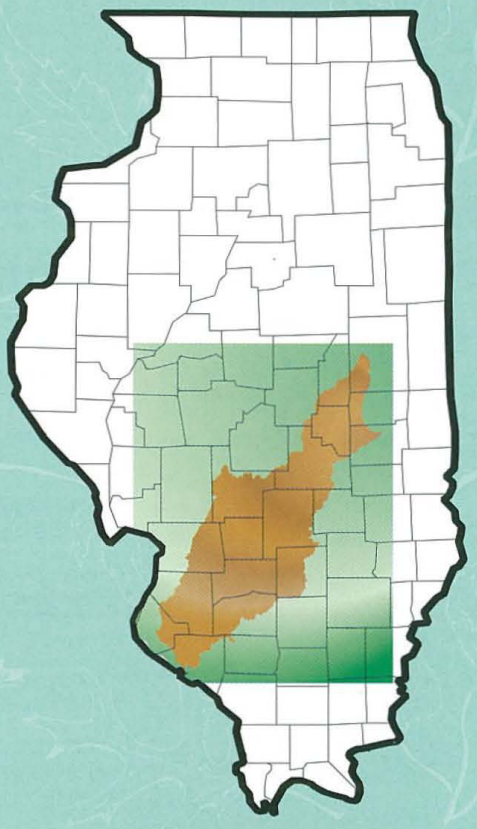

George H. Ryan, Governor
State of Illinois

✦

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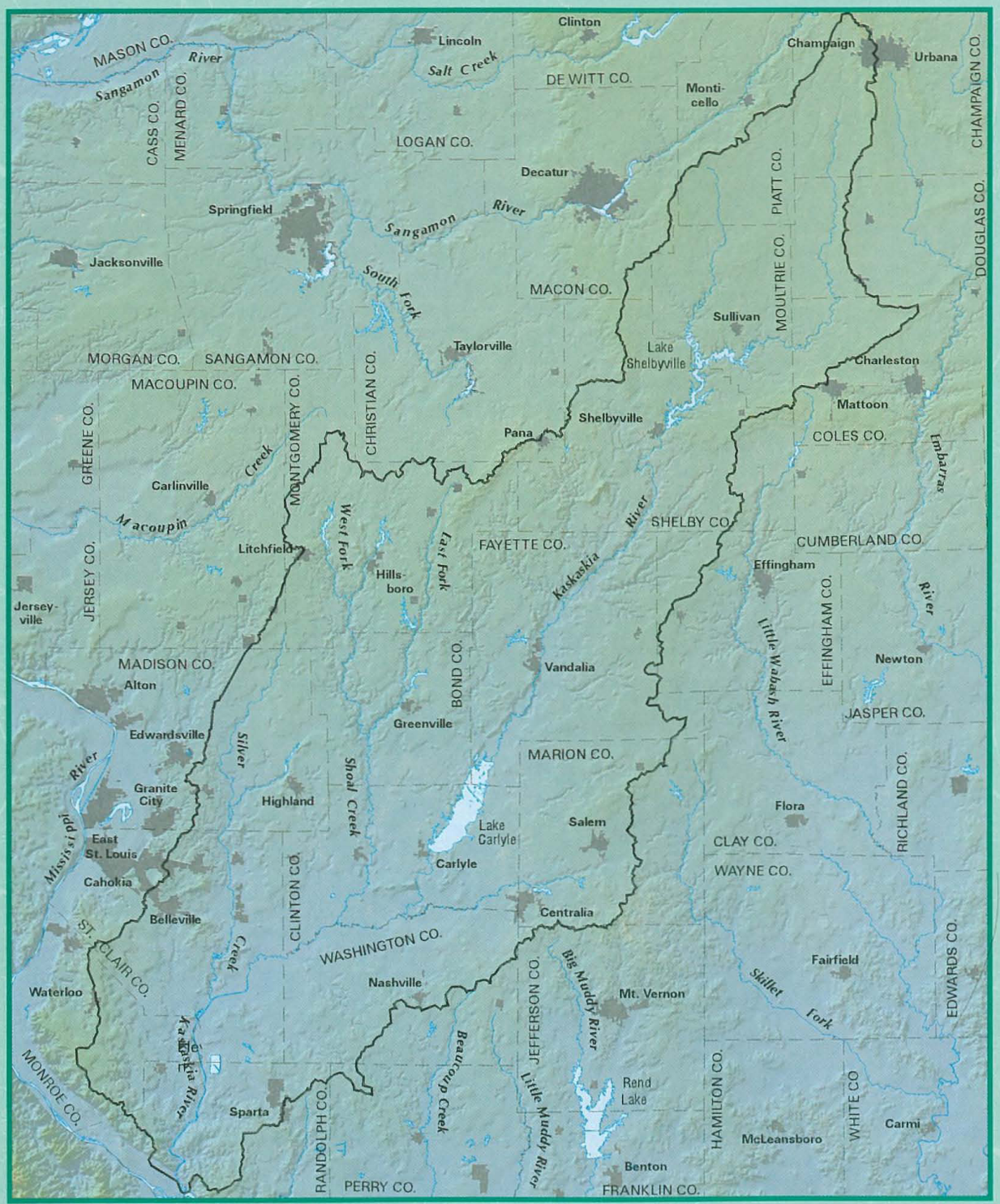


LISA SMITH AND CHRIS GOLDSMITH • ILLINOIS STATE GEOLOGICAL SURVEY

0 10 20 30 40 50

Miles

360 540 720 municipalities

450 630 810 open water

assessment area boundary

county boundary

rivers and streams

The Kaskaskia River Basin

An Inventory of the Region's Resources

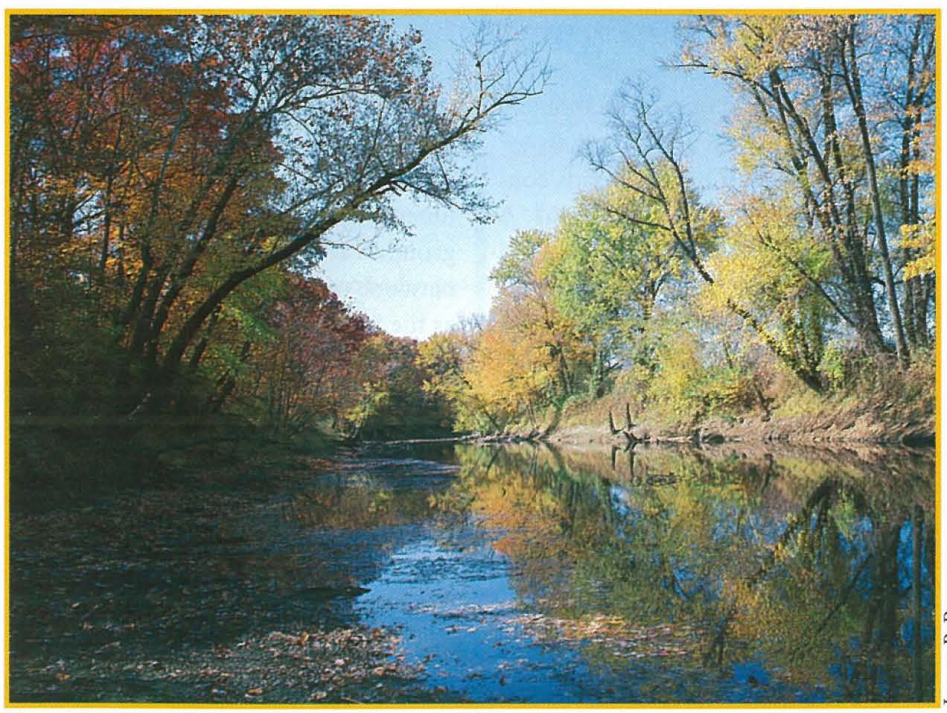
The Kaskaskia is the second longest river in inland Illinois. Measured by almost any standard — ecological, recreational, economical — it is **the** crucial natural resource for a great swathe of mid-Illinois. The river is not, however, a dominating physical presence. Through much of its length it travels in disguise. For more than 30 miles it masquerades as two massive lakes — two of the three biggest in inland Illinois. Its lowermost 36 miles, upstream from where it empties into the Mississippi, has been remodeled as a barge canal. Along much of the rest of its course the Kaskaskia's presence is masked by some of the most extensive bottomland forests left in the state.

The watershed of the Kaskaskia River takes in all or parts of 22 counties, from Champaign County in east-central Illinois to south-central Randolph County — more than 5,700 square miles or 10.2% of the land surface of the state. It is large enough that climatic differences from one end to another are fairly marked. Average annual precipitation is about one inch higher in the southern parts of the watershed than in the northern parts, and some plants found in the south — species such as overcup oak, sugarberry, and swamp holly — are not found in the north. The 9% of this area that is considered to be especially rich in ecological resources amounts to nearly 325,000 acres, most of which are found in and along the Kaskaskia itself.

The region was one of the first to be settled in Illinois, and thus among the first to be altered. The vegetation was a familiar Illinois mix of prairie and forest, but the proportions of each varied within the region. Grasslands dominated in the northern one-third of the watershed. The southern two-thirds of the region is more rugged and thus more wooded, as ravines offered trees shelter from both prairie fires and drought. An estimated 60% of the surface in this part of the watershed was forested (counting open woods in the form of savanna) when settlement began.

The Kaskaskia watershed still has lots of trees, although most of this is new growth on once-cleared land. Forest makes up about 13% of today's ground cover, most of it crowded into stream bottoms and on hillsides in its more rugged southern two-thirds. Within the nearly 136,000 acres of bottomland forest is Illinois' largest block of contiguous forest, a 7,000-acre tract of floodplain forest and post oak flatwoods that, in places, is two miles wide.

Partly because large chunks of



James P. Rowan

The substrate of the Kaskaskia River is mostly sand, gravel and mud. The river has many pools and runs, but few riffles. Its total length is a little more than 300 miles.

bottomland have been placed in protected public ownership, wetlands today account for an unusually large 4.5% of the region's surface. These 166,000 acres are nearly a quarter of the presettlement wetland acreage. Bottomland forest is by far the most common wetland type, making up three-fourths of the local wetlands, but the local inventory includes six other types of wetlands, including marsh, shrub swamps, seeps, and (in the potholed karst area in the region's southwest corner) ponds.

Some of the presettlement prairies were expansive enough that they were given place names. Shoal Creek Prairie in western Clinton County and Looking Glass Prairie in Bond County were among those landmark grasslands. As nature recycled generations of tallgrass plants, an especially rich soil was produced that was a wonderful medium for crops. An 1843 emigrants' guide claimed "The land [around Vandalia] is very good, but far from markets or boatable waters." Once railroads connected local farmers to markets in distant cities, prairies became economically fit for agriculture.

As farmers converted local prairies to cropland, whole ecological classes of prairie disappeared from the region. Wet prairies were common in the upper reaches of the Kaskaskia watershed — Moultrie County is thought to have been 40% wetlands prior to settlement, much of it ill-drained uplands sprouting prairie — but the installation of field drainage systems eliminated them all. Where prairie survived it was in corners of the landscape unfit for cultivation. Virtually all the prairie remnants in today's watershed persist in cemeteries or railroad rights-of-way.

Savanna, a park-like landscape of scattered mature trees growing amid tallgrass prairie plants, was once quite common across this part of Illinois. Regular wildfires used to kill off most trees, frustrating nature's tendency to turn savanna into denser forest. With settlement the fires were stopped. By the 1840s it was already plain that, as traveler William Oliver put it, "In the prairies timber increases rather than diminishes with the progress of settlement." A century and a half later, only three acres of this once-common habitat exist in the watershed.

Other habitats, also modest in extent, add diversity to the region. Two glacial drift hill prairies totaling 3.6 acres took root directly in the glacial drift that in most places forms the subsoil. Sandstone cliffs occur as well. These demanding environments host unique plant communities — a high-quality example occurs in the Rock Cave Nature Preserve near Altamont in Effingham County.

In the far southwest corner of the watershed the surface is underlain by limestone that has been dissolved by groundwater, creating a subterranean network of caves and fissures known as the Sinkhole Plain. Caves are unusual environments, and here they support moderately diverse aquatic macroinvertebrates, including species of annelid worms, crustaceans, and insects not commonly collected from other parts of Illinois.

Shrub swamps occur on overflow channels and in oxbows. Shrub swamps are fairly rare in Illinois, and a quarter of the high-quality examples (77 acres at three sites) are found in the Kaskaskia watershed. The biggest is Wagon Lake in St. Clair County, 60 acres of which have been ranked Grade A in ecological terms.

PLANTS AND ANIMALS

In spite of the massive ecological reordering in the past couple of centuries, the Kaskaskia watershed is still home to an impressive array of living things.

- About two in five species of vascular plants known in Illinois, or more than 1,100, can be found in the region.
- Scientists have cataloged 112 species of fish, 42 species of mussels, 27 species of large crustaceans such as crawfish, and populations of aquatic worms and insects that are as diverse as any in Illinois. One of the most unusual is the Illinois cave amphipod, *Gammarus acherondytes*, which in the whole world is found only in the caves of the Sinkhole Plain. This light gray-blue crustacean is less than an inch long and lives in the "dark zone" of cave streams where it feeds on dead animals and plants, and on bacteria on submerged rocks.
- Nineteen amphibian species, 48% of those known in Illinois, occur here, or used to. Reptiles are somewhat better represented with 36 species, or 60% of those found in the state.
- At least 287 of the 300 bird species that regularly occur in the state can be found in the region — 139 of these breed or formerly bred here. The wooded bottomland in particular offers birds many ecological niches. Where forest hugs the banks one finds great horned owls. Cliff swallows and kingfishers hunt near bridges. Open water attracts ducks, and shrubby swamps on the banks bustle in season with willow flycatchers and yellow warblers. The Kaskaskia River has some of Illinois' largest breeding populations of red-headed woodpecker, cerulean warbler, yellow-billed cuckoo, and red-shouldered hawk.

Michael Jeffords

The Marion County Prairie Chicken Sanctuary Nature Preserve (56 of whose 160 acres lie within the watershed) was set aside to preserve habitat for one of Illinois' two remaining populations of that vanishing grassland bird.

■ Forty-nine of Illinois' 59 species of mammal are known or are thought likely to occur in the watershed. They include the Indiana bat, whose numbers have so declined that the survival of the species is considered endangered in the U.S. as a whole.

A surprising number of animal species can adapt to a landscape altered for human purposes. Reptiles such as the fox snake and prairie king snake can tolerate life in mowed rights-of-way, pastures, and edges of farm fields. The western chorus frog can breed in temporarily flooded fields and ditches. Deer increased their numbers near settlements as wolves that once kept deer populations in check were quickly killed off as threats to sheep and pigs.

Between roughly 1880 and 1930 farming also boosted habitat for many species of bird. Open, grain-filled barns were perfect habitat for barn owls, offering shelter, elevated perches from which to spy on prey, and plenty of mice and rats. The vast stretches of the watershed devoted to pasture and to small grains were ideal habitat for many grassland birds. Quails were caught by scores in ground nets. David August Friederich described growing up on a farm near New Memphis Station in Clinton County in the 1920s. "Occasionally a flock of quails that had been scared into flight by something would fly through the trees and see the house too late," he recalled, "breaking their neck[s] when they hit the house."

Prairie chickens thrived as settlers eliminated two threats to this ground-dwelling species — fire and bison. By the mid-1800s prairie chickens were commonly seen on some local prairies in flocks of hundreds. They were heard too, thanks to the booming mating calls of the males. Reported Oliver, "In a calm morning [the sound] can easily be

The Area at a Glance

Δ The Kaskaskia, the second longest river in inland Illinois, is **the** crucial natural resource for a great swathe of mid-Illinois.

Δ The watershed of the Kaskaskia River takes in all or parts of 22 counties, from Champaign County in east-central Illinois to south-central Randolph County — more than 5,700 square miles or 10.2% of the land surface of the state.

Δ The 9% of this area that is considered to be especially rich in ecological resources amounts to nearly 325,000 acres, most of which are found in and along the Kaskaskia itself.

Δ Before European settlement, grasslands dominated in the northern one-third of the watershed. The southern two-thirds of the region was more wooded.

Δ Forest makes up about 13% of today's ground cover, most of it crowded into stream bottoms and on hillsides in its more rugged southern two-thirds.

Δ Illinois' largest block of contiguous forest is found here, a 7,000-acre tract of floodplain forest and post oak flatwoods that, in places, is two miles wide.

James P. Rowan

A surprising number of animals can adapt to a human landscape. Reptiles such as the fox snake, above, can tolerate life in mowed rights-of-way, pastures, and edges of farm fields.

heard a mile." He adds, "This fowl is excellent eating." The birds were so easily caught in traps that hunters thought it a waste of lead and powder to go after them with guns.

In general, however, most native species found survival in the humanized Kaskaskia watershed to be a test. Beaver, trapped for their pelts, were nearly extinct by the 1840s and the gray wolf, hunted as vermin, was gone by then. Minks and barred owls were routinely killed when they attacked domestic chickens. Later, as farm practices changed, species that once thrived in the company of humans were doomed. By the 1930s the prairie chicken was nearly extinct in Illinois because pastures and hayfields had been converted to crop fields. Similarly, barn owls became mostly extirpated from this region — as they did in most of Illinois — with the demise of the open barn.

Today the region's fauna is threatened not by human predation but by the loss of habitat. Ecologically high-quality habitat has been especially hard hit, as these examples make clear.

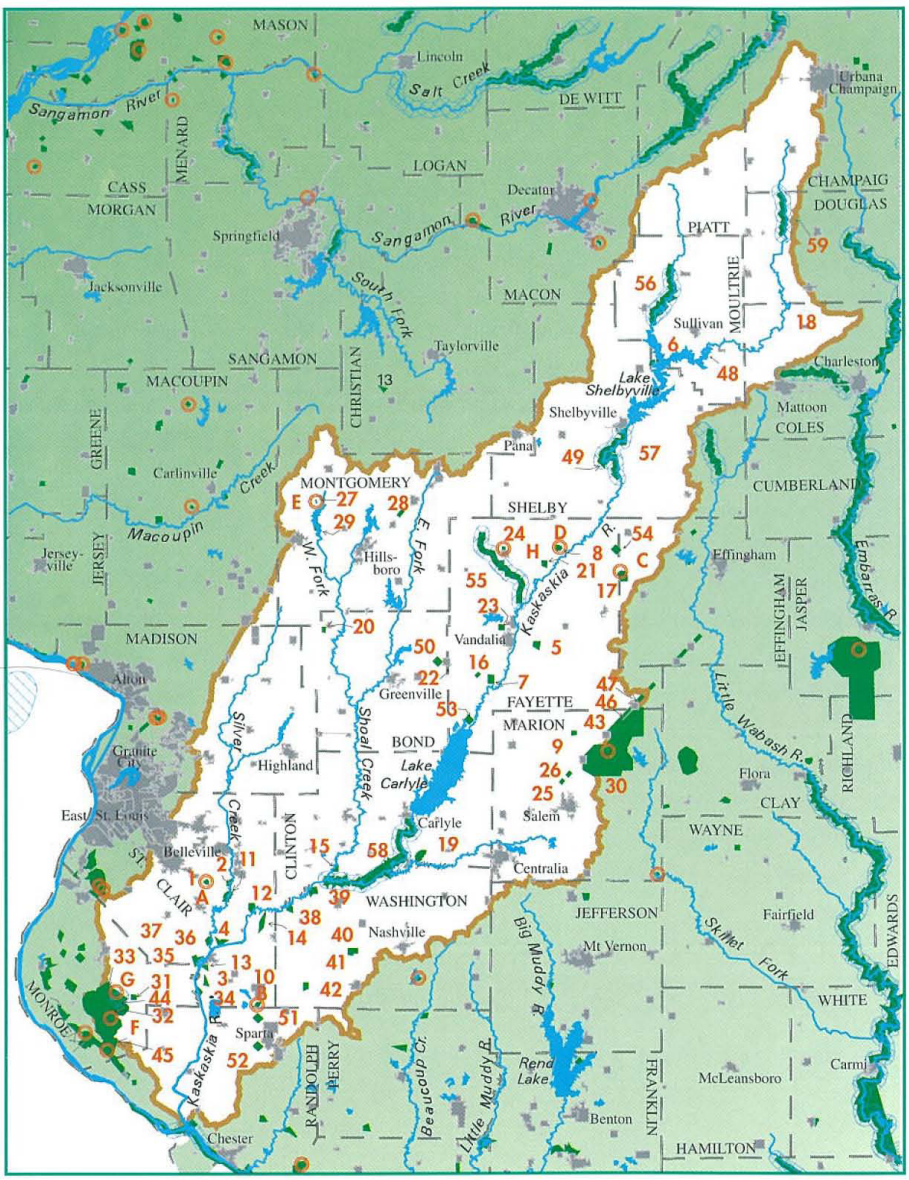
- The acreage of high-quality forest surviving in the region is small, only a little more than 1,300 acres of five different forest types — 0.28% of the region's modern forest and only 0.11% of the area that was forested at settlement.
- Only one acre of high-quality savanna persists in the watershed, at the Roberts Cemetery Nature Preserve in Montgomery County, which has been unplowed and undisturbed since 1807. About 11 acres of high-quality prairie remain in the watershed — 0.0005% of the original expanse.
- Less than 700 acres of local wetlands are in high-quality condition, 0.1% of total wetland acreage.
- Less than 1% of the basin's stream miles — 86 miles of stream segments — are recognized as Biologically Significant Streams (BSS) because they harbor rare species or an especially rich diversity of mussel and fish species. Three segments of the Kaskaskia River are on the list — between Route 16 to Howe Creek in Shelby County, between the Champaign-Douglas county line and Illinois Route 36, and between U.S. Route 50 and Shoal Creek in Clinton County. The other BSS segments include the tributary to Horse Creek in Mammoth Cave, the upper reaches of Ramsey Creek in Fayette County, and the West Okaw River from its mouth to Stringtown Bridge in Moultrie County.

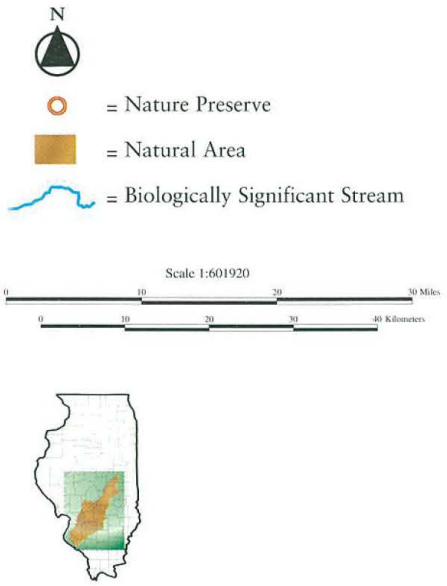
Presettlement natural communities have been altered in character as well as extent. Forests are a good example. Fires that once cleared forest floors of tree seedlings and new shrubs are no longer allowed to burn, making the understory of the region's woods shadier. Grazing animals kill off delectable plants, leaving others (many of them exotics with thorns or bristly fruits) to thrive at the expense of native wildflowers. Floodplain forests have been buried in silt from eroded fields upstream. Forests of all types have been divided into smaller and smaller parcels, exposing more of their interiors to predators and light.

Even while the number of species present in the region remains fairly high, the numbers of individuals are declining, largely because of habitat loss. Here are some examples.

- Of the 41 native mussel species found in the region, specimens of only 14 have been collected alive in the past 20 years. Many were probably always rare, but the state-threatened spike mussel was relatively common in the region until the 1950s; it was last collected alive in 1979 at Carlyle in Clinton County.

Natural Areas, Nature Preserves, and Biologically Significant Stream Segments





Illinois Natural Areas Inventory Sites

1. Julius J. Knobeloch Woods
2. Silver Creek Marsh
3. Baer Brothers Woodlot
4. Freeburg Rod and Gun Club Woods
5. Sonneman Woods
6. Sullivan Woods
7. Fish Lake Woods
8. Dean Hills
9. Sandy Branch Woods
10. Marissa Woods
11. Freeburg Woods
12. Jackson Slough Woods
13. Lively Branch Woods
14. Wagon Lake
15. Eversgerd Flatwoods
16. Bauman Pond
17. Rock Cave
18. Humboldt Railroad Prairie
19. Lost Creek Prairie
20. Sorento Geological Area
21. Ramsey Marsh
22. Mulberry Grove Geological Area
23. Vandalia Geological area
24. Ramsey Lake Railroad Prairie
25. Salem Leckrone Airport Railroad Prairie
26. Alma Railroad Prairie
27. Roberts Cemetery Savanna
28. Irving Railroad Prairie
29. Shoal Creek Barrens
30. Prairie Ridge - Marion County
31. Bradley Branch Woods
32. Fogelpole Cave
33. Dry Run Cave System
34. Wirth Island
35. New Athens Woods
36. Silver Creek Woods
37. Floraville Geological Area
38. West End Sportsman's Club Woods
39. Sipple Slough Woods
40. Bohbrink Woods
41. Williams Creek Woods
42. Johnson Woods
43. Twelve Mile Prairie (tract No. 6)
44. Illinois Caverns Cave System
45. Renaul Cave System
46. Twelve Mile Prairie (tract No. 4)
47. Twelve Mile Prairie (tract No. 5)
48. Coneflower Hill Prairie
49. Harmon Cemetery Site
50. Mulberry Grove Railroad Prairie
51. Leemon Site
52. Sparta Site
53. Carlyle Lake Site
54. Wolf Creek Sedge Site
55. Ramsey Creek
56. West Okaw River
57. Kaskaskia River
58. Kaskaskia River - Carlyle
59. Kaskaskia River - Chicken Bristle

Illinois Nature Preserves

A. Julius J. Knobeloch Woods
B. Marissa Woods
C. Rock Cave
D. Dean Hills
E. Roberts Cemetery Prairie
F. Fogelpole Cave
G. Armin Krueger Speleological
H. Ramsey Railroad Prairie

Managing the Kaskaskia

The Kaskaskia River moves placidly enough except for a few places upstream, where its flow is interrupted by coarse pebbles and glacial boulders. Its irregularity is in its course, not its bed. The Kaskaskia's channel twists and turns so much that it takes 300 miles to cover the 180 miles that lie between its source in Champaign County and its mouth in Randolph County.

It used to be even longer. In 1881 the high-running Mississippi River sliced through a bend seven miles above the Kaskaskia's mouth and poured into the smaller river's bed — which at that point ran parallel to it — taking over the final seven miles of the Kaskaskia's channel where it still runs. Humans have since shortened the river even more. Engineers straightened or "channelized" the river to speed the movement of water through it, slicing off many bends and leaving the bottom littered with new lakes.

If the Kaskaskia wanders a bit, it is because it is not prodded very hard by gravity. Its slope seldom varies from one to one and one-half feet per mile, so a heavy storm or snowmelt dumps water into the lower Kaskaskia River faster than the river can carry it away. When this happens, this ordinarily modest stream suddenly becomes miles wide.

The Native Americans knew the river's habits well. "Kaskaskia" is alleged by one expert to be an Indian tribal name meaning "uncertain". Euro-Americans eventually learned about the river's unpredictability too, after floodwater repeatedly swept through their state capital in the 1800s.

In this century the river's neighbors have tried to control floods by catching and holding runoff before it can inundate towns and farm fields in the vulnerable bottomlands. In effect, engineers have created a permanent flood where they can control it — in upstream reservoirs built for the purpose — in order to prevent floods downstream, where they cannot. One of these reservoirs is Lake Shelbyville. Downstream from Lake Shelbyville the Kaskaskia was dammed again to form Carlyle Lake.

Managing complex natural systems creates some complex problems. Building campgrounds on the shores of Lake Shelbyville added extra value to the public's investment in the project. But if engineers let water back-up in the reservoir during wet spells, the campgrounds are flooded and boaters can't squeeze their craft under the bridges. Keeping the lake level low means letting farm fields flood downstream.

For all the headaches, Lake Shelbyville has not dramatically reduced the amount of flood water that moves past Vandalia, some 35 miles downstream, because much of the water that floods the bottomland around Vandalia enters the river downstream from the lake. However, the reservoirs do seem to have reduced how long water stays high in the river's lower reaches. In short, the reservoirs have changed the flooding problem but they have not eliminated it.

John Marlin

A dredge digs a nine-foot navigation channel through the Kaskaskia River bottom in the early 1970s. The dredge slurried water with sediment and soil and pumped it into large settling ponds. The project straightened the river by cutting through bends, significantly shortening it.

■ Some fish species such as the bigeye chub and pallid shiner or the river redhorse have not been seen in the region since the turn of the previous century. Even species still present have been much reduced in range; the western sand darter once swam widely in the Kaskaskia, but today occurs only in a small part of the river in Shelby County.

■ The massasauga snake was once so numerous in the region's prairie wetlands and bottomland forests that 19th century guidebooks listed it among the common hazards of life in this part of Illinois. Today the species is known only from the south end of Carlyle Lake. Kirtland's snake needs both prairies and wetlands for its lifecycle and as these habitats have become rare in the region, so has the snake.

■ Ear-leaved foxglove is a plant that was found decades ago from six sites within the watershed; more recent surveys suggest that only one, possibly two, of these sites still support this plant.

■ Nearly three dozen species of birds once known in the region (such as the yellow-headed blackbird) are either locally extinct or are only rarely present during breeding season — confirmation of widespread habitat loss outside the blocks of forest along the Kaskaskia and its tributary streams.

A number of plant and animal species have suffered population declines severe enough that their continuing presence in Illinois is considered to be threatened, even endangered. At least 59 species of these "T&E" plants and animals occur in the Kaskaskia watershed: 12 plants, 29 birds, two mammals, two reptiles, five fishes, eight mussels and one crustacean. One of the listed plants is violet collinsia (*collinsia violacea*), which occurs only in two close-by colonies near the Kaskaskia River in Shelby County. The primary range of this plant lies west of Illinois, so its presence in Illinois is a botanical riddle. Possibly, the plant moved into Illinois when one of the continent's recurring climate shifts favored it, then was stranded when conditions changed.

While the region as a whole is not especially rich in rare species, an exception is the local population of birds. The welcoming forests along the Kaskaskia are a big reason why nearly 90% of Illinois' threatened and endangered bird species have found refuge here.

HUMAN USE OF THE LAND

For thousands of years, the earth has provided what successive civilizations have needed to thrive. Native American and early Euro-American cultures were essentially creatures of the forest and the rivers. Later, coal provided the crucial resource in the watershed's industrial development — the most extensive coal bed in the U.S., known as the Colchester Member, underlies the region. Old strip mines whose pits have long since filled with water can be seen around Sparta in Randolph County. The remnants of two dozen deep mines can be found under roughly 28 square miles of Bond, Clinton, Marion, and Moultrie counties. Adoption of tougher federal clean air rules in the 1970s made the local high sulfur coal an unattractive energy source. Most mines have shut down or curtailed production, although the active underground mine in Clinton County is a reminder of what coal used to mean to the region's economy.

There is oil here too. The state's first commercial oil well was drilled near Litchfield in 1885. Carlyle enjoyed a spurt of growth following a boom in 1911, and the discovery in the 1930s

The Area at a Glance

Δ Wetlands account for an unusually large 4.5% of the region's surface; bottomland forest makes up three-fourths of the wetlands. These 166,000 acres are nearly a quarter of the presettlement wetland acreage.

Δ As farmers converted local prairies to cropland, whole classes of prairie disappeared from the region. Wet prairies were common in the upper reaches of the Kaskaskia watershed but field drainage systems eliminated them all.

Δ Virtually all the prairie remnants in today's watershed persist in cemeteries or railroad rights-of-way and only three acres of savanna exist.

Δ Other habitats add diversity to the region, such as glacial drift hill prairies, sandstone cliffs, caves and fissures, and shrub swamps.

Δ The Kaskaskia watershed is still home to an impressive array of living things: more than 1,100 species of vascular plants, 112 species of fish, 42 species of mussels, 27 species of large crustaceans, 19 amphibian species, 36 species of reptiles, at least 287 bird species — 139 of these breed or formerly bred here — and 49 species of mammal.

of fields near Salem briefly energized Marion County towns like Pakota and St. Elmo. For a time Illinois was the nation's #3 producer, but production peaked in the 1940s and has been declining ever since.

Water remains a crucial natural resource. Groundwater is available in the extreme northeast part of the watershed, which is rich in sand-and-gravel aquifers. Quality groundwater is much more scarce in the central and southern parts of the region. As William Oliver traveled east across the area in the 1840s, he was served local well water at a doctor's cabin. He later wrote, "If he only could have induced people to come and drink of it, he need never have wanted patients."

Fortunately, the creek valleys of the rugged southern part of the watershed make good potential lake basins, and towns there have tended to store water for public use in surface reservoirs. Most larger communities draw their water from constructed lakes such as Lake Lou Yaeger, Highland Silver Lake, and Vandalia Lake. (The region's two largest reservoirs, Carlyle and Shelbyville, were built mainly to control floods and are only now becoming major sources of drinking water.)

The earth here yields commercially significant amounts of clay, sand and gravel, and limestone, but the most valuable mineral resource is topsoil. The soils are chock-full of minerals from glaciers and organic matter from prairie plants. Climate adds to the soils' suitability for farming. Rains are plentiful in the growing season, which extends just over half the year. As a consequence, more than 80% of the region's land surface is devoted to some kind of agriculture, which proportionately is a bit more than in Illinois as a whole.

Most of this cropland is devoted to the familiear Illinois staples of corn and soybeans. Washington County, however, is Illinois' leader in wheat production and Clinton County is second in the state in the number of milk cows, a legacy of its settlement by Swiss immigrants. The area around Vandalia and Centralia has been a fruit-growing center since before the Civil War.

The eight main counties through which the Kaskaskia and its tributaries flow has a mixed economy in which manufacturing is relatively more robust than statewide. Service industries have become important too, and the larger employers now include hospitals and state facilities such as prisons. However, the farms and feedlots of the Kaskaskia still earn about $630 million a year in gross receipts, which makes farming relatively more important economically in the Kaskaskia River basin than in the rest of Illinois.

The region has seen the number of local farms shrink by 25% since 1978, partly because 6% less land is farmed but mainly because small farms continue to be consolidated into bigger operations. Nonetheless, nearly 10% of the workforce is employed in farming, compared to less than 2% statewide.

A RECREATION CAPITOL

The Kaskaskia watershed has seen its share of history. It was one of the first parts of Illinois settled by river-borne Euro-Americans. Vandalia was the western terminus of the National Road (more popularly known as the Cumberland Road from its origins in Cumberland, Maryland), which was the predecessor in scale if not convenience to today's interstate highways. The region boasts two state capitals (Kaskaskia from 1818 to 1820 and Vandalia from 1820 to 1839). Famous men lived here — William Jennings Bryan, among others — and Abraham Lincoln not only spoke here but also practiced law and served in the legislature.

When rivers ceased to be the main highways in Illinois, the Kaskaskia watershed ceased to be the center of the state's commercial and civic life. In recent years it has become important again, this time as a recreation capital. A significant amount of land has been set aside as parks, fish and wildlife areas, and public forests — more than 87,000 acres or 2.4% of the area. There are 11 sizable state-owned recreation facilities of one kind or another, including more than 45,000 acres of state fish and wildlife areas and 10,000 acres of state parks and forests. Together they generate an estimated $30 million a year in economic activity and support more than 500 jobs.

The 11 sites account for nearly 7% of the attendance at such state-owned facilities in Illinois even though the area has only 1.7% of the state's population. Such numbers are possible because hikers, picnickers, and bird-watchers from around this part of the Midwest enjoy convenient highway access to the area. About 20% of Lake Shelbyville's visitors, for example, come from Chicago and its suburbs.

Lake Shelbyville offers recreations that are novel elsewhere in central Illinois, such as windsurfing and backpacking. The lake has been equipped with a complex infrastructure — developed campsites, picnic areas, a backpacking trail, two marinas, a

Joel Dexter

Washington County is Illinois' leader in wheat production and the region contributes about one-fifth of the state's wheat crop receipts.

swimming beach, an equestrian campground, and, at Eagle Creek, a resort and conference center. More than 6,000 acres in the upstream reaches of the Kaskaskia and the West Okaw River, which feed the lake, have been set aside as the Shelbyville State Fish and Wildlife Area, and Eagle Creek State Park and Wolf Creek State Park occupy opposite sides of the lake proper.

Carlyle Lake, with a surface area of 26,000 acres, is "Illinois' other Great Lake," and the largest inland lake in the state of Illinois. The shoreline is in public hands, and parts of it have been developed as the Eldon Hazlet and South Shore state parks and the Carlyle Lake Fish and Wildlife Area.

A combination of wide open water, low surrounding terrain, and strong winds make Carlyle Lake one of the Midwest's most popular sailing lakes. Eldon Hazlet State Park hosts the Carlyle Sailing Association whose members land-store more than 400 sailboats. West Access Marina accommodates more than 300 cabin sailboats and houseboats.

Fishing is understandably popular, as Carlyle Lake is home to more than 30 species of fish, including such sought-after game fish as white bass, channel cat, crappie, and largemouth bass. Hunters may seek varied quarry too, both here and at nearby private clubs. The lake's fringes include flooded timber as well as open water in which waterfowl may rest, protected from guns. The Carlyle Lake Fish and Wildlife Area offers 15,000 acres that are used as stopover habitat for migrating birds such as herons and egrets, and assorted shorebirds. Such areas are managed using traditional habitat enhancement techniques such as planting fields in corn, milo, millet, and winter wheat, then flooding them in the fall to welcome the flocks heading south. Natural wetland vegetation is also being enhanced as part of the program.

Further downstream, the Kaskaskia River State Fish and Wildlife Area

The Area at a Glance

Δ The Kaskaskia River has some of Illinois' largest breeding populations of red-headed woodpecker, cerulean warbler, yellow-billed cuckoo, and red-shouldered hawk.

Δ Today the region's fauna is threatened by the loss of habitat. Ecologically high-quality habitat has been especially hard hit.

Δ The acreage of high-quality forest surviving in the region is small, only a little more than 1,300 acres of five different forest types — 0.28% of the region's modern forest.

Δ Only one acre of high-quality savanna persists in the watershed, at the Roberts Cemetery Nature Preserve in Montgomery County, which has been unplowed and undisturbed since 1807.

Δ About 11 acres of high-quality prairie remain in the watershed — 0.0005% of the original expanse. Less than 700 acres of local wetlands are in high-quality condition, 0.1% of total wetland acreage.

Δ Less than 1% of the basin's stream miles — 86 miles of stream segments — are recognized as Biologically Significant Streams (BSS) because they harbor rare species or an especially rich diversity of mussel and fish species.

(SFWA) flanks the lowermost 36 miles of the river from Fayetteville to the Mississippi River. This mixed bottomland forest totals more than 20,000 acres, making it one of the largest state-owned sites of its type in Illinois. Stands of pecan, soft maple, oaks, shellbark hickory, and willow are interspersed with cultivated and fallow fields and patches of native grass and brush. About 14,000 acres are open to hunting of varied prey, from waterfowl to forest game such as squirrel and upland game in the form of rabbit and quail.

Within the Kaskaskia River SFWA is Baldwin Lake. The lake is an artificial basin built by the Illinois Power Company to store cooling water pumped into it from the nearby river. The 2,018-acre lake and adjoining lands are leased to the state for recreational purposes, and have been designated a waterfowl and wildlife refuge. The lake waters are warmed by discharged cooling water from the Baldwin power plant; this keeps the lake virtually ice-free and allows fishing in any season.

Peabody-River King State Fish and Wildlife Area is another site adjacent to the Kaskaskia SFWA. About 90% of the 2,000-acre site is reclaimed strip mine land donated to the state by Peabody Coal Company. The site has 20 lakes and ponds covering more than 500 acres in all and offers hunting for upland game, such as doves attracted to the sunflowers grown in several reclaimed fields.

THE HUMAN HABITAT

The Kaskaskia watershed remains rural. In the 120 years after 1870, Illinois' population more than tripled while that of the eight counties that cover most of the region increased only 30%. As a result, those eight counties encompass 8% of the state's land but are home to only 1.7% of its people. The largest city, Centralia, has fewer than 15,000 residents. Towns and cities combined take up only 3.1% of the region's surface, which is significantly less than the corresponding statewide figure of nearly 6%.

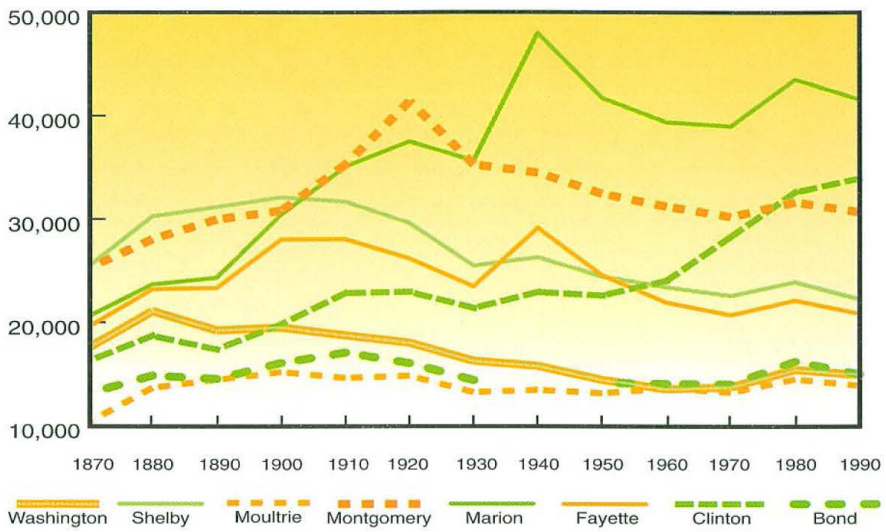
The population trends in the rural counties of the Kaskaskia watershed are consistent with rural Illinois as a whole. One is the continuing depopulation of the countryside that is remote from cities. Two counties in the region, Shelby and Washington, had fewer people in 1990 than they did in 1870. The countryside near urban centers, however, is repopulating after decades of decline as people relocate there from city centers and close-in suburbs.

Most of the southern third of the region lies within 50 miles of down-

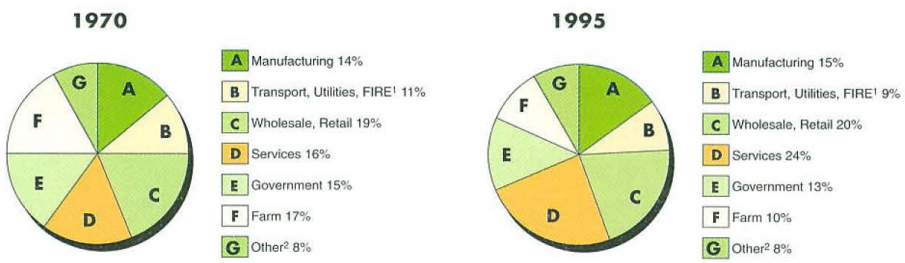
Joel Dexter

The Kaskaskia River valley, with it's quiet roads, beautiful scenery and rich farmland, is a haven for cyclists and Amish farmers alike. A 32-mile group bike ride, above, called "Bikes and Buggies" followed the Kaskaskia River near Cook's Mill, stopped at Arthur and returned to Mattoon.

Kaskaskia Population Trends



Changes in Employment Distribution in the Kaskaskia River Area



[1] Finance, insurance, and real estate [2] Construction, mining, and agricultural and forestry services

town St. Louis, and is closer still to that city's Illinois suburbs. Counties closest to Metro East are likely to attract the most new residents over the next 20 years as city people continue to take advantage of cheap gas, good roads, and low-priced land to make homes in the country. "Vehicle miles traveled" or VMT is a rough index of urban sprawl, since people who live farther from jobs, workplaces, and stores must drive more. VMT in the region increased one-fifth faster than the statewide rate since 1973, with much of that increase taking place since 1980.

From 1970 to 1995 Clinton County recorded the most new households (up 44%), the most new housing, and the strongest growth in jobs and personal income among the principal counties of the region. It is a diverse migration, including commuters, second-home-buyers drawn to Carlyle Lake, and retirees looking for a quiet refuge from city life.

Urbanization is only one of the changes that continue to alter the natural

The Area at a Glance

Δ While the number of species present in the region remains fairly high, the numbers of individuals are declining, largely because of habitat loss. Some examples:

- Of the 41 native mussel species, only 14 have been collected alive in the past 20 years.
- Some fish species such as the bigeye chub and pallid shiner or the river redhorse have not been seen in the region since the turn of the previous century.
- The massasauga snake was once so numerous in area prairie wetlands and bottomland forests that it was considered a common hazard. Today the species is known only from the south end of Carlyle Lake.
- Ear-leaved foxglove is a plant that was found decades ago from six sites within the watershed; more recent surveys suggest that only one, possibly two, of these sites still support this plant.
- Nearly three dozen species of birds once known in the region (such as the yellow-headed blackbird) are either locally extinct or are only rarely present during breeding season.

Flatwoods

Michael Jeffords

Flatwoods (specifically southern-style flatwoods) are a unique ecological feature of the Kaskaskia watershed. Some of the finest examples of this plant community remaining in Illinois — indeed in the midwestern U.S.— are found here. Sites such as the Eversgerd Flatwoods natural area in Clinton County make up nearly three-fourths of the roughly 450 acres of high-quality flatwoods in the state.

Flatwoods, as the name implies, are usually found on former lake bottoms and other ill-drained terrain. They grow atop claypan, a shallow-lying subsoil that is largely impervious to water. In wet times water that percolates through the topsoil is trapped by the impermeable clay and ponds up, leaving plant roots saturated for long periods. Areas where water has accumulated host plants that are typical of wetland rather than upland forest. Plants such as the slender spike rush are found in nearly every flatwoods.

In summer evaporation sucks moisture out of the shallow topsoil. The moisture is not replenished as it is in most soils because the claypan prevents the subsoil moisture from moving toward the surface.

It's a tough environment for plants. Trees found in flatwoods tend to be drought-tolerant species ordinarily found on uplands, such as post oak and black-jack oak. The floor of a flatwoods is populated by a botanically interesting mix of species from dry uplands and wet bottomlands that are seldom found together in other settings.

So demanding is a flatwoods environment that introduced plant species that have become pests in most Illinois woods often cannot establish themselves here. Japanese honeysuckle is about the only invasive newcomer that occurs in the flatwoods of the Kaskaskia watershed. Similarly, the suppression of fire, which is altering the character of many Illinois forests, has not had so dramatic an impact on flatwoods. The natural droughtiness is nearly as effective as fire in limiting the encroachment of shrubs and other plants adapted to more clement settings. The result is that Illinois' flatwoods show a stability of both structure (the age mix of trees) and composition (the mix of species) that is very unusual for Illinois woods of any type.

Chas J. Dees

Egrets congregate in a wetland at Eldon Hazlet State Park, a 3,000-acre site on the western shore of Carlyle Lake.

systems in the Kaskaskia watershed. Others include habitat fragmentation, competition from non-native species, the modification of natural systems, pollution (including eroded soil), and the suppression of natural fires.

Fragmentation

Construction of roads, fields, and houses divides once-intact forests, wetlands, and prairies into small habitat islands. The region's 11 acres of high-quality prairie are split into six sites and the roughly 1,300 acres of high-quality forest are spread across 21 separate sites. Nearly 700 acres of high-quality wetlands are split into 15 sites.

When habitats are so small, even accidental disturbances — a misread construction blueprint, for example, or a gust of wind while spraying weed killer — can be enough to doom them. Fragmentation also severs the natural landscape links that connect disparate habitats. This makes life difficult for amphibians like the American toad, which migrates every spring from upland forests to lowland areas to breed. The entire populations of some plant and animal species in such splintered tracts may consist of only a few individuals. The smaller such local populations are, the more vulnerable they usually are to disease and in-breeding stress.

Fragmentation is common everywhere in Illinois. What makes the Kaskaskia watershed unusual is how much unfragmented forest survives. Eighteen tracts of forested wetlands are bigger than 1,000 acres each, and eight of these cover 2,000 acres or more each. All lie within a 30-mile radius of Germantown — along the Kaskaskia River between Fayetteville and Carlyle Lake, at the upper end of Carlyle Lake, and along Shoal Creek. Surveys have confirmed the dramatic effect that an intact cover can have on the ability of forest birds to thrive. Fragmentation has exposed forest birds elsewhere in Illinois to such predators as raccoons and pet dogs and cats, and to nest parasites such as the brown-headed cowbird. The deep woods along

The Area at a Glance

Δ At least 59 species of threatened or endangered plants and animals occur in the Kaskaskia watershed: 12 plants, 29 birds, two mammals, two reptiles, five fishes, eight mussels, and one crustacean.

Δ Nearly 90% of Illinois' threatened or endangered bird species have found refuge here, primarily because of the welcoming forests along the Kaskaskia.

Δ Groundwater is available in the extreme northeast part of the watershed which is rich in sand-and-gravel aquifers. Quality groundwater is much more scarce in the central and southern parts of the region.

Δ The most valuable mineral resource is topsoil which is chock-full of minerals from glaciers and organic matter from prairie plants. Consequently, more than 80% of the land surface is devoted to some kind of agriculture.

Δ Washington County is Illinois' leader in wheat production and Clinton County is second in the state in the number of milk cows, a legacy of its settlement by Swiss immigrants. The area around Vandalia and Centralia has been a fruit-growing center since before the Civil War.

Michael Jeffords

Only one acre of high-quality savanna persists in the watershed, at the Roberts Cemetery Nature Preserve (above) in Montgomery County, which has been unplowed and undisturbed since 1807.

the Kaskaskia offer shelter from all these threats. Resident birds enjoy high rates of nesting success. Parasitism levels for some species in Illinois' more fragmented forests approach 100%; for acadian flycatchers along the Kaskaskia they are below 10%. Birds hatched in these woods migrate and populate nearby regions where local birds are not replacing themselves.

Exotic Species

Nearly 18% of the plant species found in the region are not native to Illinois. Twenty-five of these introduced plant species do so well in their new environment that they are considered invasive. For example, creeping Charlie, osage orange, and moneywort are common invaders of the region's wetter floodplain forests. A few of these exotic species can be controlled by prescribed burns; the others need diligent and repeated hand-pulling or selective dosing with herbicides to keep their growth in check.

Some non-native animals, such as the house mouse, occupy niches not already occupied by natives and thus have little effect on the ways ecosystems function. However, other exotics intrude on native species whose habitat needs are similar. The common carp, an Asian fish, has flourished at the expense of ecologically similar natives like the carpsucker and the buffalo.

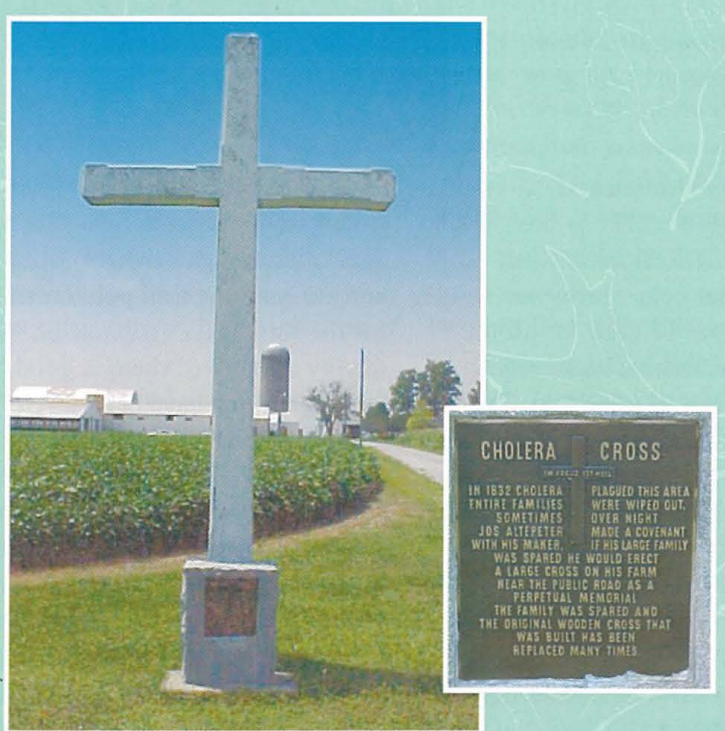
Modification

Because natural drainage is relatively poor in the flat northern parts of the watershed, 30-40% of the streams have been straightened and dredged. This "channelization" is done to speed the flow of water off the surface. In the geologically older downstream sections where drainage is well-defined, only

The Cholera Cross

Because the Kaskaskia watershed is a young landscape with a still-developing stream system and fine-textured subsoils, water moves across and into its surface slowly. Even upland areas lay waterlogged much of the year. In the past the soggy soils made travel tedious and farming unpredictable. Worse, the poorly drained flatlands were perfect habitat for disease. One traveler who arrived at Vandalia in the 1840s, when "bilious fever" was widespread, noted with misgivings the presence of what he called "a very extensive morass on the river bottom opposite the town" as a modern traveler might note the near presence of a toxic waste dump.

Like many of their neighbors, German farmers who settled around Breese suffered so sorely from malaria and other water-borne diseases that they built crosses on their properties to protect their families from sickness. In 1850 one farmer made a covenant with God that if he and his family survived the epidemic, he would place a large cross on his land as a perpetual memorial. The "Cholera Cross" still stands on the Germantown Road a mile south of Breese. The covenant has been kept through several changes of owners and crosses; the most recent was erected in 1962.



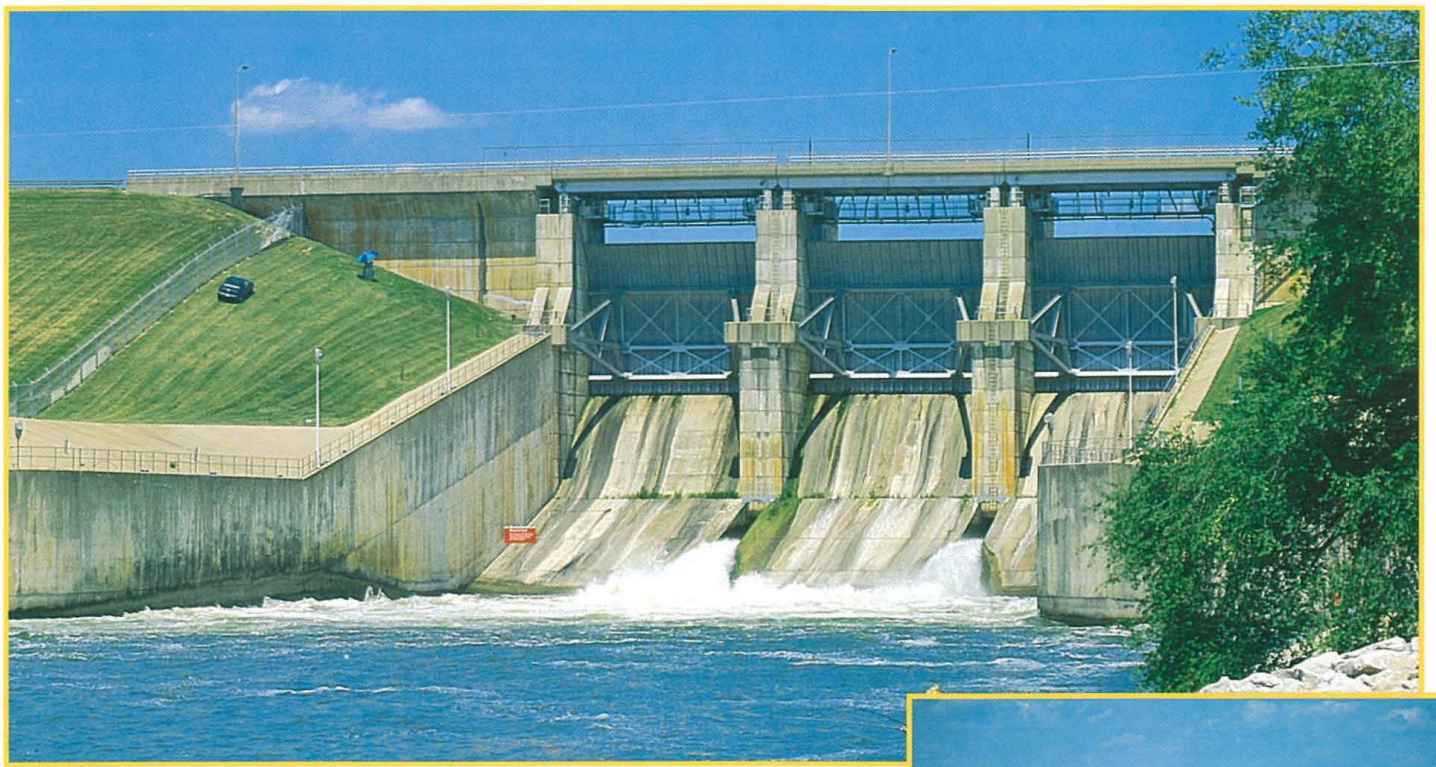
Randy Holbrook

The Area at a Glance

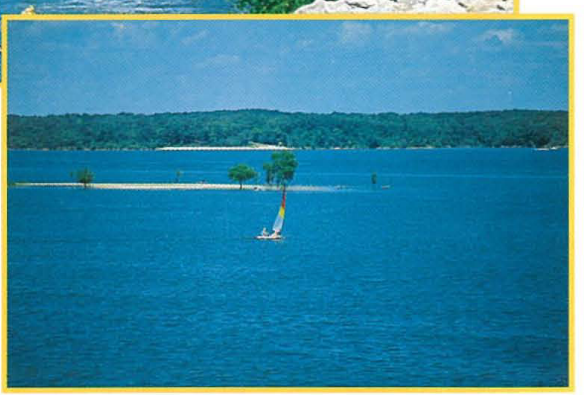
Δ The region has seen the number of local farms shrink by 25% since 1978, partly because 6% less land is farmed but mainly because small farms continue to be consolidated into bigger operations. Nonetheless, nearly 10% of the workforce is employed in farming, compared to less than 2% statewide.

Δ The area has a mixed economy in which manufacturing is relatively more robust than statewide. Service industries have become important too, and the larger employers now include hospitals and state facilities such as prisons.

Δ A significant amount of land has been set aside as parks, fish and wildlife areas, and public forests — more than 87,000 acres or 2.4% of the area. There are 11 sizable state-owned recreation facilities of one kind or another, including more than 45,000 acres of state fish and wildlife areas and 10,000 acres of state parks and forests. Together they generate an estimated $30 million a year in economic activity and support more than 500 jobs.



Joel Dexter



The Kaskaskia River was dammed at Shelbyville to help prevent floods downstream. The resulting 11,000-acre Lake Shelbyville provides water recreation in the form of fishing, boating, sailing, windsurfing and swimming. Surrounding state parks and fish and wildlife areas together feature hunting, hiking trails, a snowmobile trail, an equestrian trail, picnic areas, campgrounds and a lodge.

an estimated 15% of the stream reaches have been channelized.

The Kaskaskia itself also has been remodeled, though for a different purpose. As part of the Kaskaskia River Navigation Project, Congress authorized construction of a lock and dam that backs up water in the river's channel to form a pool deep enough to float commercial barges. This dam transformed the lower river into a lake that is nine feet deep, 225 feet wide, and 36 miles long. Straightening the channel chopped across so many bends that the distance by water from Fayetteville to the river mouth was shortened by approximately 14 miles.

Pollution

The Illinois Environmental Protection Agency (IEPA) has determined that the Kaskaskia River upstream from Lake Shelbyville is clean enough to be used for all the purposes that federal water regulations were designed to protect. That's also true for most of the river between Lake Shelbyville and Carlyle Lake, and for another 27 miles further downstream. Parts of the rest of the river are polluted to a relatively minor extent by agricultural chemicals, wastes from coal mines and oil fields, and discharges from a chemical plant at River Mile 264.

The lowest reaches suffer variously from excess nutrients (which encourages ruinous algae growth), siltation, and various chemical pollutants. As for the Kaskaskia's tributaries, water quality in most of them is good, although a few have been severely degraded by livestock wastes.

A total of 29 lakes in the watershed, covering 2,602 acres, were also assessed by the IEPA. Like all lakes, they are catchment basins for whatever is dug, dumped, or sprayed into their watersheds. Overall, resource quality is "good" on only 10 acres (0.1%) and "fair" on 2,592 acres (99.9%). The primary causes of water quality prob-

lems are siltation and suspended solids attributed to runoff from farms.

Erosion

Siltation is occurring in virtually every Illinois stream and lake, and is by far the biggest cause of water quality impairment in the Kaskaskia watershed. Among other changes, siltation makes water bodies more shallow (and thus warmer in summer) and murkier (because of particles stirred up by fish and watercraft).

In the 1970s and '80s, before soil-saving farming techniques came into wide use, erosion rates were high in some parts of the watershed — in a bad year more than 300 tons of topsoil were lost from each square mile of farmland. Erosion rates are assumed to be much lower today. Farmers cultivate nearly 40% of the region's acreage using soil-saving methods. Also, many acres of highly erodible land have been taken out of crop production through long-term conservation contracts with the federal government. Consequently, 74% of the farmland in the watershed is at or below tolerable soil loss levels.

The potential for erosion is mitigated to some extent by the region's mostly flat terrain. Still, with so much soil exposed for so much of the year, a lot of topsoil shifts from place to place. Erosion rates vary with precipitation, which itself varies enormously from season to season and year to year. Data from one sediment monitoring station on the Kaskaskia show that during one 18-year period, concentrations of soil particles in the water varied from less than one milligram per liter to nearly 1,700.

Much of the eroded soil ends up in streams, lakes, and ponds. Sedimentation rates in most of the region's lakes are low to moderate compared to the typical Illinois lake. This is not true in the lower reaches of the Kaskaskia River in St. Clair and Randolph counties, where the dammed river functions like a lake. When the water runs low, the river current lacks the energy to carry suspended soil particles and they settle out, burying the lower riverbed each summer beneath as much as a foot of fine silt. The brisk flows of spring floods dislodge some of this annual accumulation, but parts of the Kaskaskia Navigation Canal have silted in permanently, only 35 years after being built.

Fire Suppression

So frequent and widespread was the burning of prairies that well into the 1800s the smoke left the air in this part of Illinois "dull and smoky" for weeks each fall. Lightning started many a prairie fire but so did Native Americans, who found that burning off the dead grasses cleared the ground and made hunting and traveling easier. Euro-Americans continued the practice during the decades when the still-open prairies were used as common grazing land, because the burns sparked the growth of fresh grass. However, as 1800 approached the Kaskaskia watershed was densely enough settled that the territorial legislature stipulated that prairie land could be "fired" only between December and March.

Suppressing fires helps to destroy prairies. Trees and shrubs kept at bay by fire invade prairies when fires stop. This makes life difficult for the many prairie plants that cannot tolerate shade, and easier for cool-season grasses like meadow fescue that compete with them. Fire suppression also had dramatic effects on Illinois forests. Oaks were common in Illinois forests at settlement in part because they are relatively tolerant of fire. Stopping fires favored trees

The Area at a Glance

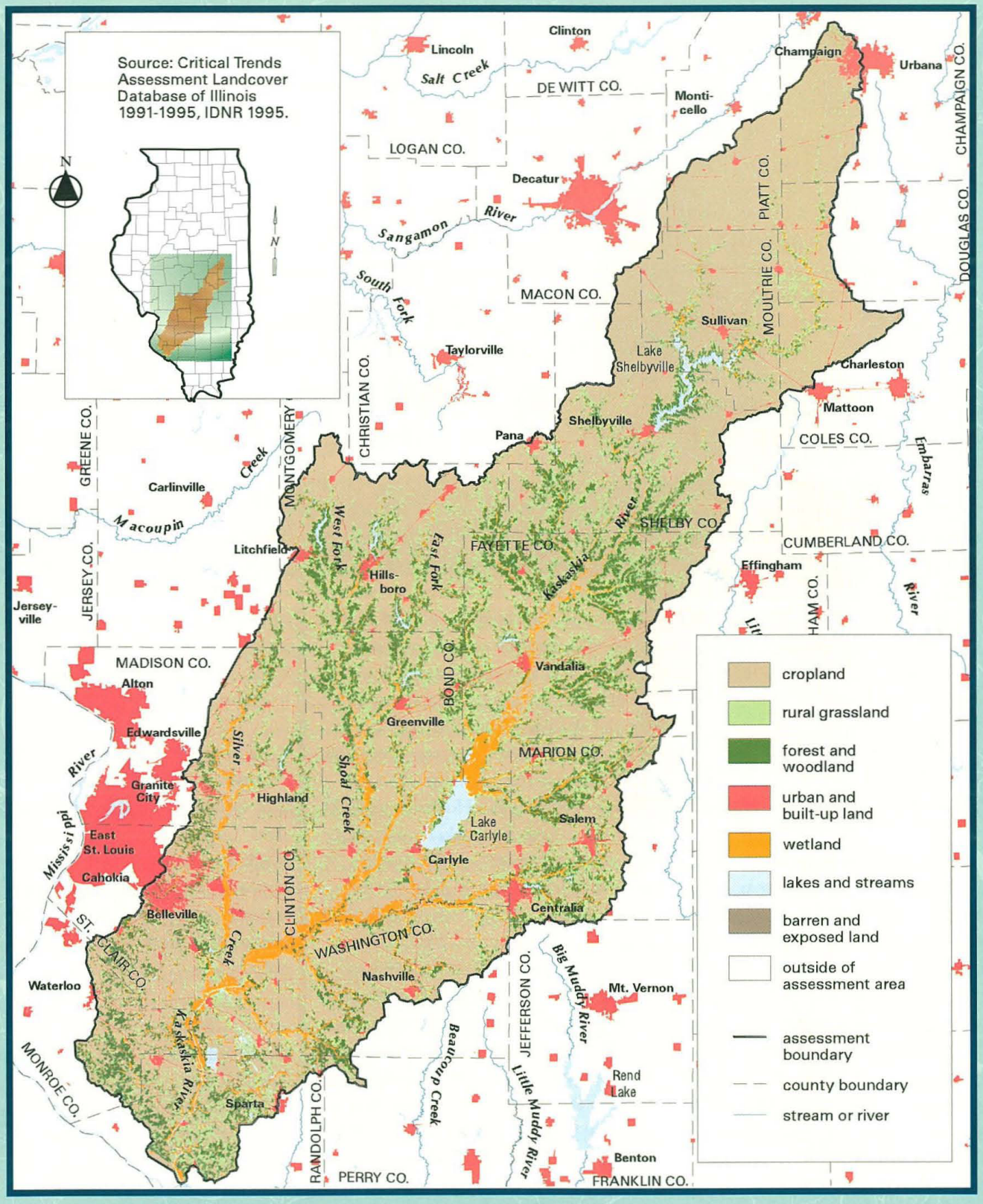
Δ Fishing is popular at Carlyle Lake, home to more than 30 species of fish, including such sought-after game fish as white bass, channel cat, crappie, and largemouth bass.

Δ The eight main counties through which most of the Kaskaskia flows encompass 8% of the state's land but are home to only 1.7% of its people. Towns and cities combined take up only 3.1% of the region's surface, which is significantly less than the corresponding statewide figure of nearly 6%.

Δ Vehicle miles traveled (VMT) is a rough index of urban sprawl, since people who live farther from jobs, workplaces, and stores must drive more. VMT in the region increased one-fifth faster than the statewide rate since 1973, with much of that increase taking place since 1980.

Δ Urbanization is only one of the changes that continue to alter the natural systems in the Kaskaskia watershed. Others include habitat fragmentation, competition from non-native species, the modification of natural systems, pollution (including eroded soil), and the suppression of natural fires.

Land Cover



Lisa Smith and Chris Goldsmith
Illinois State Geological Survey

Michael Jeffords

The blackjack oak, quercus marilandica, *is found primarily in upland forests, sand forests, flatwoods and savanna.*

like sugar maples that can't stand fire; as maples sprout in the forest understory, young oaks — which require more sun — struggle to establish themselves. By now many Illinois woods are dominated by mature oak in the forest canopy and by young maples on the forest floor.

As the populations of tree species in a forest change, so do the populations of other living things. By summer and fall, the shade on the floors of most Illinois forests has become too dense for most native wildflowers to bloom, since most are adapted to life in a more open forest. Animal populations change too. Tree squirrels, flying squirrels, and chipmunks tend to be more abundant in forests containing larger numbers of nut-bearing trees such as oaks and hickories. Survey data suggest that the cerulean warblers around Lake Shelbyville — perhaps the state's largest population of that songbird — also require a moderately high density of large oaks to thrive.

PROTECTION AND RESTORATION

A survey in the 1970s by the Illinois Natural Areas Inventory (INAI) found 60 top-quality natural areas within the watershed. Most (43) of these are remnants of 19 presettlement natural community types, from cliffs to dry barrens to shrub swamps. Another seven are habitats for T&E species, four are significant geologic areas, and six are outstanding aquatic areas. The remnants vary in ecological quality; the least altered cover a total of only 1,420 acres, or 0.04% of the Kaskaskia watershed (compared to 0.07% of high quality remnants statewide). However, data from the INAI survey are now 20 years old and in some cases no longer describe the region accurately. Some high-quality areas have been degraded, even destroyed, in that period, including 23 acres of high quality dry upland forest that was cleared for development.

A few of these natural areas have

The Area at a Glance

Δ The region's 11 acres of high-quality prairie are split into six sites and the roughly 1,300 acres of high-quality forest are spread across 21 separate sites. Nearly 700 acres of high-quality wetlands are split into 15 sites.

Δ Nearly 18% of the plant species found in the region are not native to Illinois.

Δ Because natural drainage is relatively poor in the flat northern parts of the watershed, 30-40% of the streams have been straightened and dredged.

Δ Siltation is by far the biggest cause of water quality impairment in the Kaskaskia watershed.

Δ In the 1970s and '80s erosion rates were high in some parts of the watershed; today farmers cultivate nearly 40% of the region's acreage using soil-saving techniques and 74% of the farmland is at or below tolerable soil loss levels.

Δ Ten nature preserves and 60 top-quality natural areas lie within the watershed.

Geology

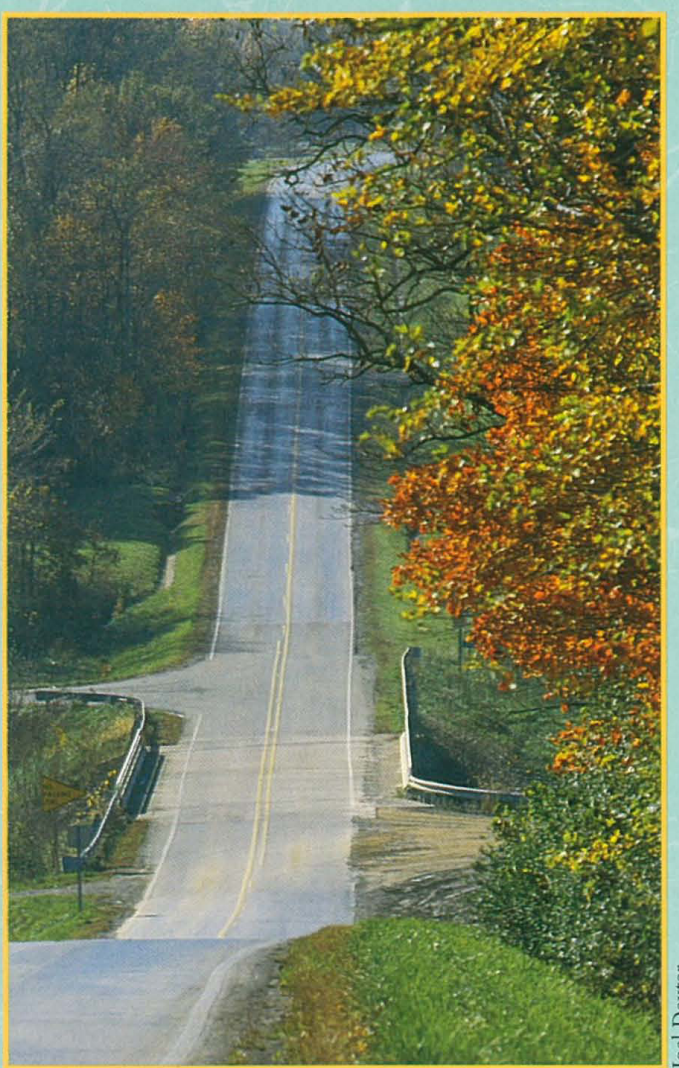
Visitors confronting the remarkable flatness of this part of Illinois attribute it to the leveling effects of glacial ice. This is accurate up to a point. The glaciers did not so much carve the ancient landscape of the Kaskaskia watershed as bury it. When the ice sheets melted they left uncountable tons of rock rubble that had been pushed along or carried frozen in the ice. Collectively known as drift, this muddle of debris piled up as deep as 300 to 400 feet in some of the old river valleys. Even the then-upland areas were buried beneath 50 feet or so of drift.

Most of the covering material was till, which is sands and gravels, clays, and silts mixed with rocky rubble from boulders to pebbles. (The new landscape came to be know as a till plain.) The icing on this glacial cake was loess (pronounced "luss"). These dust-sized silts, clays, and fine sands were left in great swaths along the banks of major rivers, then lifted by winds and redeposited downwind. Along the Mississippi River bluffs the loess lies 80 to 90 feet thick but gradually thins as one moves east. It is usually less than five feet thick around Bond County. Loess is the mineral-rich parent material for about 90% of the region's rich topsoils.

Although virtually all the surface features in the Kaskaskia watershed were formed by glaciers, they weren't all created by the same glaciers. Upstream from Lake Shelbyville the land was visited by glaciers of the Wisconsinan era, which receded from there a mere 19,000 years ago. Below that are the remains of the earlier Illinoian glaciation — untouched by the most recent ice — which receded about 125,000 years ago. The older Illinoian landscape is also generally flat, but because it has been exposed to erosion much longer it has developed a more widespread system of surface rills, creeks, and streams.

A geologist can reconstruct the movement of past ice sheets from today's landscape the way a policeman can reconstruct a car accident from skid marks on the road. Occasionally the ice's bulldozer advance was stymied for decades, as weather shifted and ice melted from its forward edge as fast as new ice was pushed forward to replace it. Ice-borne debris was dumped at the edge by this icy conveyor belt, piling up in ridges known as moraines that can extend for dozens of miles. These end moraines are still here in many places, nicely marking the precise extent of the ice that created them.

The end moraines of the younger Wisconsinan landscape have not yet been worn down by weather. The most prominent is the 50-foot-high Shelbyville Moraine, a



Joel Dexter

Shelbyville Moraine

natural berm that separates the old and new landscapes of the watershed. It snakes across the middle of the state for miles and is wide enough to accommodate the town after which it is named. The Kaskaskia River breaks through this barrier as it spills onto the Illinoian till plain to the southwest.

The ice left other clues. Kames are small hills formed when glacial outwash piled up in hillocks as debris-laden water poured through cracks in the ice. The landscape of the Kaskaskia is dotted by kames such as Williamsburg Hill and Corley Ridge between Cowden and Pana in Shelby County.

For some 80 miles from Shelbyville to the southwest is a section of scenic high ground 20-30 miles wide consisting of ridges and knolls made variously of sand, sand and gravel, silt, and gravely till. This broken terrain provides scenery and a bit of a mystery. The ridges may be old moraines from the Illinoian glaciation, or perhaps debris that accumulated in vast crevasses in the ice. Reading the lessons in the land is difficult; separate lobes of that era's ice sheet intersected here, thus the geologists' designation of the area as the Interlobate Complex. Such relics (some of which may be seen in the Vandalia Geologic Area) are to the region's geologic past what its abandoned railroad lines and old coal mines are to its human past.

been given formal protection as Illinois nature preserves. Ten such preserves lie wholly or partially within the Kaskaskia watershed. If the watershed was a 12'x12' room, the roughly 500 acres of land set aside in nature preserves would cover an area smaller than a business card. The preserves have importance out of proportion to their size, however, as they provide unmatched opportunities for research, pleasure, or protection of rare species. Among them is the Marion County Prairie Chicken Sanctuary Nature Preserve (56 of whose 160 acres lie within the watershed) that was set aside to preserve habitat for one of Illinois' two remaining populations of that vanishing grassland bird. Another is the Ramsey Railroad Prairie Nature Preserve in Fayette County, which contains the last 11 acres of undegraded prairie that survive within the watershed.

Many acres of natural communities of various types, while not ecologically pristine, are still worth enhancing for use as habitat, seed sources, wildlife corridors, and other purposes. For example, local conservationists have diligently conducted prescribed burns and cut invading plants to restore the Shoal Creek Barrens, home to two plant species on the state's threatened and endangered species list — buffalo clover and blazing star. A degraded prairie, the 3.5-acre Hill Prairie near the extreme southeast corner of Lake Shelbyville's Kaskaskia River Unit, has so improved under restoration management since 1975 that it now harbors more than 50 species of native plants

The Area at a Glance

Δ Many acres of degraded natural communities can be enhanced for use as habitat, seed sources, wildlife corridors, and other purposes. The 3.5-acre Hill Prairie has so improved under restoration management that it now harbors more than 50 species of native plants and more than 200 species of birds.

Δ In the late 1990s summer censuses of forest bird populations in small woodlots around Lake Shelbyville counted Cooper's hawks for the first time since 1985. The wild turkey has come back too, as has the double-crested cormorant and the bald eagle.

Δ The extent of its forested bottomland makes the Kaskaskia watershed ecologically significant. A forest larger than 500 acres is not just larger than a forest of 200 acres. Because of the shelter provided by its interior, it is a different kind of forest too.

James P. Rowan

and more than 200 species of birds.

Even partial habitat restoration can spur the return of long-absent species. The bobcat, once so scarce that its survival in Illinois was considered threatened, has been reported in nearly all the counties in the watershed. State-threatened river otters, which require extensive river habitat, were released at three sites in the mid-1990s. They seem to have established themselves in the region, although exactly how successfully they are reproducing is not known.

In the late 1990s summer censuses of forest bird populations in small woodlots around Lake Shelbyville counted Cooper's hawks for the first time since 1985. The wild turkey — a "stately" bird that could dart through the woods "with the speed of a hound," in the words of one admiring European — has come back too, as has the double-crested cormorant and the bald eagle.

The extent of its forested bottomland makes the Kaskaskia watershed ecologically significant in modern Illinois. A forest larger than 500 acres is not just larger than a forest of 200 acres. Because of the shelter provided by its interior, it is a different kind of forest too.

Much of this forested treasure remains in private ownership, including the very largest such tract, nearly 30,000 acres along the Kaskaskia River in St. Clair, Monroe, and Washington counties. Fortunately, residents recognize the value of this land and are working to protect it and to restore areas that have already been destroyed or fragmented. In 1997 they formed the Original Kaskaskia Area Wilderness, Inc. (OKAW) land trust to promote conservation easements and to work with landowners to close forest openings, thereby reducing fragmentation.

If they are successful in keeping this corridor intact, it could end the cycle started 300 years ago when the first settlers began transforming Illinois.

Top, the blazing star, liatris scariosa, *is one of Illinois' 66 threatened plant species that can be found in the Kaskaskia River basin. It is primarily associated with upland forest, savanna and barrens.*

Bottom, the bald eagle, one of eight birds classified as threatened in Illinois, has come back to the area around Lake Shelbyville.

(continued from inside front cover)

In addition to coordinating IDNR programs with those of Ecosystem Partnerships, the Ecosystems Program:

- provides technical assistance to the partnerships, such as resource management plans for use by participating landowners;
- assesses resources in the area encompassed by each Ecosystem Partnership, collecting data that the local partners themselves may use to set project priorities and design projects, and supplying scientific support to ecosystem partners, including on-going monitoring of Ecosystem Partnership areas;
- funds site-specific ecosystem projects recommended by each partnership. Such projects may involve habitat protection and improvement, technical assistance, and research and education, including projects that seek to expand the relationships between natural resources, economic development, and recreation.

To provide focus for the program, IDNR developed and published the *Inventory of Ecologically Resource-Rich Areas in Illinois,* and is conducting regional assessments for areas in which a public-private partnership is formed.

The Kaskaskia River Basin: An Inventory of the Region's Resources is based on one of these assessments, the *Kaskaskia River Area Assessment.* The assessment was compiled by staff of IDNR's Division of Energy and Environmental Assessment, Office of Realty and Environmental Planning; and the Illinois State Museum, the Illinois Waste Management and Research Center, and the Illinois Natural History, State Geological, and State Water Surveys of IDNR's Office of Research and Scientific Analysis.

The *Kaskaskia River Area Assessment* and all other CTAP and Ecosystems Program documents are available from the IDNR Clearinghouse at (217)782-7498 or TDD (217)782-9175. Many are also available on the EcoForum Bulletin Board at (800)528-5486 or (217)782-8447. Documents also are available on the World Wide Web at:

http://dnr.state.il.us/ctap/ctaphome.htm and
http://dnr.state.il.us/c2000/manage/partner.htm.

For more information about CTAP, call (217)524-0500 or e-mail at ctap2@dnrmail.state.il.us; for information on the Ecosystems Program, call (217)782-7940 or e-mail at ecoprg@dnrmail.state.il.us.

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